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| Substitute for form 1449/PTO<br><br><b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br><br>(Use as many sheets as necessary) |   | <b>Complete if Known</b> |                        |                        |                          |
|                                                                                                                                       |   | Application Number       | 10/693,315-Conf. #1495 |                        |                          |
|                                                                                                                                       |   | Filing Date              | October 24, 2003       |                        |                          |
|                                                                                                                                       |   | First Named Inventor     | Takao ABE              |                        |                          |
|                                                                                                                                       |   | Art Unit                 | 1624                   |                        |                          |
|                                                                                                                                       |   | Examiner Name            | M. L. Berch            |                        |                          |
| Sheet                                                                                                                                 | 1 | of                       | 2                      | Attorney Docket Number | AM100905 (36119.227-US1) |

| U.S. PATENT DOCUMENTS |                       |                                          |                                |                                                    |                                                                                 |
|-----------------------|-----------------------|------------------------------------------|--------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------|
| Examiner Initials*    | Cite No. <sup>1</sup> | Document Number                          | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines, Where<br>Relevant Passages or Relevant<br>Figures Appear |
|                       |                       | Number-Kind Code <sup>2</sup> (if known) |                                |                                                    |                                                                                 |
|                       | AA*                   | US-4,977,256                             | 12-11-1990                     | Aoyagi et al.                                      |                                                                                 |

| FOREIGN PATENT DOCUMENTS |                       |                                                                                   |                                |                                                    |                                                                              |                |
|--------------------------|-----------------------|-----------------------------------------------------------------------------------|--------------------------------|----------------------------------------------------|------------------------------------------------------------------------------|----------------|
| Examiner Initials*       | Cite No. <sup>1</sup> | Foreign Patent Document                                                           | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines, Where<br>Relevant Passages Or Relevant Figures Appear | T <sup>6</sup> |
|                          |                       | Country Code <sup>3</sup> -Number <sup>4</sup> -Kind Code <sup>5</sup> (if known) |                                |                                                    |                                                                              |                |
|                          | BA                    | WO-96/04285-A1                                                                    | 02-15-1996                     | Synphar Laboratories, Inc.                         |                                                                              |                |

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. \* CITE NO.: Those application(s) which are marked with an asterisk (\*) next to the Cite No. are not supplied (under 37 CFR 1.98(a)(2)(iii)) because that application was filed after June 30, 2003 or is available in the IFW. <sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

| NON PATENT LITERATURE DOCUMENTS |                       |                                                                                                                                                                                                                                                                 |                |  |
|---------------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--|
| Examiner Initials               | Cite No. <sup>1</sup> | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T <sup>2</sup> |  |
|                                 | CA                    | Abe, T. et al., "A Novel, Mild, and Facile Method to Prepare 6-Methylidene Penem Derivatives," J. Org. Chem. 2004, 69, 5850-5860.                                                                                                                               |                |  |
|                                 | CB                    | ABIKO, et al., "Concerning the Boron Mediated Aldol Reaction of Carboxylic Esters", J. Org. Chem., 61:2590-2591 (1996)                                                                                                                                          |                |  |
|                                 | CC                    | BENNETT, et al., "6-(Substituted Methylene)Penems, Potent Broad Spectrum Inhibitors of Bacterial $\beta$ -Lactamase: III. Structure-Activity Relationships of the 5-Membered Heterocyclic Derivatives", Journal of Antibiotics, 44(3):331-337 (1991)            |                |  |
|                                 | CD                    | Bennett, I. et al., "6-(Substituted Methylene)Penems, Potent Broad Spectrum Inhibitors of Bacterial $\beta$ -Lactamase, V- Chiral 1,2,3-Triazyl Derivatives," The Journal of Antibiotics, Vol. 44, No. 9, 969-978.                                              |                |  |
|                                 | CE                    | BOUFFARD, et al., "A New Approach to the Diastereoselective Synthesis of Aldols: Introduction of the 6 $\alpha$ -(1R-Hydroxyethyl) Side Chain of the Carbapenem and Penem Antibiotics", Tetrahedron Letters, 26(51):6285-6288 (1985)                            |                |  |
|                                 | CF                    | BOUFFARD, et al., "Thienamycin Total Synthesis. 1. Synthesis of Azetidinone Precursors of ( $\pm$ )-Thienamycin and Its Stereoisomers", J. Org. Chem., 45:1130-1135 (1980)                                                                                      |                |  |
|                                 | CG                    | Bouffard, F.A. et al., "Thienamycin Total Synthesis: Stereocontrolled Introduction of the Hydroethyl Side Chain," J. Org. Chem. 1981, 46, 2208-2212.                                                                                                            |                |  |
|                                 | CH                    | BUSH, et al., "A Functional Classification Scheme for $\beta$ -Lactamases and Its Correlation with Molecular Structure", Antimicrob. Agents Chemother., 39(6):1211-1233 (1995)                                                                                  |                |  |
|                                 | CI                    | DININNO, et al., "Aldol Condensations of Regiospecific Penicillanate and Cephalosporanate Enolates, Hydroxyethylation at C-6 and C-7", J. Org. Chem., 42(18):2960-2965 (1977)                                                                                   |                |  |
|                                 | CJ                    | Hayashi, K. et al., "Variable Stereoselectivity in the Imine Aldol Reactions Employing MgBr <sub>2</sub> and Et <sub>3</sub> N," Synlett, December 1996, 1203-1205.                                                                                             |                |  |
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|                                 | CL                    | INNIS, "Human Milk and Formula Fatty Acids", Journal of Pediatrics, 120(4,Pt. 2):S56-S59 (1992)                                                                                                                                                                 |                |  |

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| Examiner Signature |  | Date Considered |  |
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|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| CM  | International Search Report and Written Opinion issued April 11, 2007, in PCT/US2006/028883                                                                                                                                                                               |  |
| CN  | Masamune, S. et al., "Aldol Strategy: Coordination of Lithium Cation with an Alkoxy Substituent," J. Am. Chem. Soc. 1982, 104, 5526-5528.                                                                                                                                 |  |
| CO  | MANSOUR, "Hunig's Base-Magnesium Chloride Mediated Carbon Alkylation and Oxygen Acylation of Benzoylacetone", Tetrahedron Letters, 29(28):3437-3440 (1988)                                                                                                                |  |
| CP  | MANSOUR, et al., "N-Protected $\alpha$ -Aminomethylketone Analogues of C-Terminal p-Nitrobenzyl-3-Ketoesters of N-Protected Amino Acids", Synthetic Communications, 19(3&4):667-672 (1989)                                                                                |  |
| CQ  | Meyers, A.I. et al., "Stereoselective Synthesis of threo-3-Hydroxy-2-methylcarboxylic Acids Using Alkoxyalkyl Propionates," Journal of the American Chemical Society, 101:9, April 25, 1979.                                                                              |  |
| CR  | Office Action that issued from the European Patent Office on June 20, 2006 in EP 03 733 911.6-1211                                                                                                                                                                        |  |
| CS  | OSBORNE, et al., "Synthesis of (5R)-(Z)-6-(1-Methyl-1,2,3-triazol-4-ylmethylene-penem-3-carboxylic Acid, a Potent Broad Spectrum $\beta$ -Lactamase Inhibitor, from 6-Aminopenicillanic Acid", J. Chem. Soc. Perkin Trans., pp. 179-188 (1994)                            |  |
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| CV  | Sano, S. et al., "Lewis Acid- and Cationic Lithium-Mediated Diastereoselective Aldol-Type Reaction Based on a Double Chiral Recognition Manner for the Asymmetric Synthesis of $\alpha$ -Substituted Serines," Tetrahedron Letters, Vol. 36, No. 23, pp. 4101-4104, 1995. |  |
| CW  | Sugasawa, T. et al., "Aminohaloborane in Organic Synthesis. IV. A Directed Aldol Condensation Using Vinylaminodichloroborane," Synthetic Communications, 9(6), 515-528 (1979).                                                                                            |  |
| CX  | Sugasawa, T. et al., "Aminohaloborane in Organic Synthesis. IV. A Simple Enantioselective Aldol Synthesis," Tetrahedron Letters No. 16, pp. 1423-1426. 1979.                                                                                                              |  |
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| CA1 | Kumagai, T. et al., "Mild and Chemoselective Cleavage of p-Nitrobenzyl Esters and p-Nitrobenzyloxycarbonyl Amines with Zinc Dust," Heterocycles, Vol. 36, No. 8, 1993.                                                                                                    |  |
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